Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Petition to Authorize Co-Primary Sharing of the 450 MHz Air-to-Ground Radiotelephone Service With BETRS	)	RM-8159

To: The Commission

REPLY OF INTERDIGITAL COMMUNICATIONS CORP. TO OPPOSITION COMMENTS OF MOBILE TELECOMMUNICATIONS CORPORATION AND NATIONAL BUSINESS AIRCRAFT ASSOCIATION

by

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InterDigital Communications Corp. responds below to the comments of Mtel[1/] and NBAA[2/] in opposition to a telephone industry petition requesting that the FCC allocate the 12 450 MHz air-ground channels to the BETR service on a co-primary basis so that common carriers may apply for licenses to operate BETR systems on vacant channels. Whereas these 12 channels have been the exclusive domain of air-ground licensees for the past 23 years, petitioners propose that the FCC adopt new rules that would allow the grant of licenses to operate new BETR base stations on unoccupied channels in this band on a first-come, first-served basis. Of the 18 parties who submitted comments in response to the telephone industry's petition, only Mtel and NBAA opposed the rule changes that the petition recommends. Their oppositions were predictable since Mtel is the largest 450 MHz air-ground licensee and NBAA is a trade association of companies which own business

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1/ Mobile Telecommun. Tech. Corp.

2/ National Bus. Aircraft Ass'n.

aircraft, some of which subscribe to 450 MHz air-ground service. In addition to responding to the arguments of Mtel and NBAA in opposition to adoption of the rules which the petitioners recommend, InterDigital also reiterates the importance of adopting certain other new rules discussed in the initial comments of Alcatel and InterDigital.

SUMMARY

None of the arguments made by the objectors has merit.

° First, although the objectors claim that air-ground licensees need exclusive access to vacant channels because demand for additional air-ground transmitters is increasing rapidly, in fact demand for new air-ground transmitters is not rising rapidly.

° Second, although Mtel asserts that there is plenty of spectrum available to provide BETR service under the existing allocation, the arguments it makes to support this contention are erroneous. Thus, Mtel argues that telephone companies plainly do not need an additional allocation to meet demand for BETR service since they did not demonstrate congestion via a long-term "spectrum need" study. In fact, the absence of this study does not demonstrate the lack of congestion because there is other record evidence of congestion of a type the FCC has considered in making similar allocation decisions. Indeed, much of the record evidence is more credible than a "spectrum need" study. In addition, Mtel asserts that telephone companies could eliminate spectrum congestion by convincing manufacturers to produce BETR transmitters that make efficient use of presently available spectrum by using

digital multiplexing techniques. In fact, however, nearly 100 percent of BETR transmitters already operate in this manner. Air-ground licensees operating in the 450 MHz band, by contrast, use spectrum inefficiently by using an obsolete analog transmission mode.

° Third, Mtel argues that the Commission should not give telephone companies additional spectrum for BETR service even if it finds that existing spectrum is congested since it claims cellular licensees can provide BETR service more economically than telephone companies by using cellular frequencies as permitted under existing FCC rules. In fact, however, cellular operators cannot provide BETR service more economically than telephone companies by using their cellular frequencies.

° Fourth, NBAA and Mtel attempt to leave the vague impression that the operation of a BETR base station would cause many air-ground calls to be blocked even when co-channel BETR and air-ground base stations are located 640 miles or more from each other as the FCC would require if petitioners' proposal is adopted. In fact, however, such call blocking would occur rarely -- if ever.

Not only is it clear that the petitioners have justified their request that the FCC allocate vacant 450 MHz air-ground channels to BETR on a co-primary basis, the Commission should consider implementing a plan proposed .by Alcatel in which the agency would allocate vacant channels exclusively to the BETR Service immediately and allocate presently occupied channels to the BETR Service after a transition period.

DISCUSSION

I. 450 MHz Air-Ground Licensees Do Not Need Exclusive Access to Vacant Channels in the 450 MHz Air-Ground Band in Order to Meet Rapidly Rising Demand for 450 MHz Air-Ground Service Because Demand is Not Rising Rapidly

In an effort to persuade the FCC to preserve air-ground licensees' exclusive access to the vacant 450 MHz-band channels that are the subject of the present proceeding, both Mtel and NBAA try to create an impression that the 450 MHz air-ground industry is so vibrant that the industry needs exclusive access to these channels in order to ensure that enough spectrum exists to accommodate rapidly increasing demand for air-ground service. Thus, Mtel says that there has been "steady growth" in the licensing of additional air-ground transmitters on these channels, and it says that it expects demand for additional transmitters may "increase [further] given [that] the demands of business is requiring more travel among personnel. . . ."[3/] Similarly, NBAA characterizes growth in the number of new air-ground transmitters as "robust, not moribund as the petitioners would suggest."[4/]

However, the facts belie the image that the objectors seek to create of a vibrant 450 MHz air-ground industry which soon will need all presently vacant spectrum in order to accommodate growth. While it may be true as Mtel notes that growth in the number of 450 MHz air-ground transmitters has been "steady", Mtel fails to point

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3/ See Mtel's "Comments in Opp. to Pet. for Rulemaking" at 3 (Feb. 8, 1993).

4/ See NBAA's "Statement in Opp. to the Pet. of Rulemaking" at 3 (Feb. 8, 1993).

out that growth also has been extraordinarily slow. The FCC itself recently noted that the 450 MHz air-ground industry "was established in the 1960s and is now mature" rather than a rapidly growing industry in need of substantial amounts of vacant spectrum,[5/] and the agency's conclusion is borne out by its licensing records. For example, the FCC has issued only four authorizations to construct new air-ground transmitters in the last eight years, out of about 120 licensed transmitters. This rate of growth (an average of only one new transmitter every two years) is hardly rapid![6/] In addition, it appears that authorizations for at least 11 air-ground transmitters have been reclaimed by the Commission within the past four years alone because no one wanted to operate them. In fact, demand for new air-ground transmitters is so lethargic that there appear to be at least 41 channels allocated to specific communities for which no air-ground license has been issued and no license application is pending.[7/]

[5/] Notice of Prop. Rulemaking in CC Dkt. No. 92-115, 7 FCC Rcd. 3658, 3672 (1992).

[6/] Air-ground transmitters operate at roughly 90 of these sites, but since there is more than one transmitter at several sites, the total number of operating transmitters is about 120. At the Washington, D.C. site, for example, there are three transmitters (operating on Channels 1, 7, and 10).

[7/] Not only is growth in the number of 450 MHz air-ground base stations almost non-existent, no existing or potential air-ground customer would be denied access to service even if construction of a new BETR station precluded construction of a co-channel air-ground station that the air-ground industry wanted to build because the existing air-ground network already provides technical coverage throughout the country. The industry would seek to construct additional air-ground stations only to reduce call blocking (by adding new transmitters at existing sites) or reduce

(continued...)

The attempt by Mtel to preserve the air-ground industry's exclusive access to the 450 MHz channels by creating an appearance of rapidly growing demand for new 450 MHz air-ground transmitters is especially troubling. In 1990, Mtel -- the largest 450 MHz air-ground licensee -- obtained a license from the FCC to provide air-ground service using channels in the 800 MHz band that the agency had allocated for air-ground service a few months earlier. In applying for this license, Mtel informed the Commission that it desired the license in order to expedite the transition of its existing 450 MHz air-ground traffic to a technologically more sophisticated system operating on the 800 MHz channels that it planned to build.[8/] Indeed, although Mtel had not yet even begun construction of its 800 MHz air-ground system, it informed the agency at that time (nearly two and one-half years ago) that it already had obtained contracts to provide air-ground service via this new 800 MHz air-ground system on 154 corporate aircraft.[9/]

[7/](...continued)
the price of completing calls (by constructing transmitters at new sites in order to reduce the "landline" transmission component of telephone calls initiated from the airplane).

[8/] See "Applic. of Mobile Telecomm. Technologies Corp. for Auth. to Construct and Operate an Air-Ground System Operating in the 849-851, 894-896 MHz Bands" at Exh. 6 (Oct. 22, 1990).

[9/] Id. at Exh. 3.

II. Although Mtel Claims that Plenty of Spectrum Already Is Available under FCC Rules to Provide BETR Service, the Arguments It Makes to Support this Contention Are Erroneous

Beyond seeking preservation of the air-ground industry's exclusive access to vacant 450 MHz-band channels by claiming that many new 450 MHz air-ground transmitters must be built in order to keep up with increasing demand, Mtel also tries to preserve the air-ground industry's monopoly access to these channels with the claim that telephone companies already have available more than enough vacant spectrum to provide BETR service. As shown below, however, the two assertions it makes to support this conclusion are wrong.

A. Contrary to Mtel's Assertion, the FCC Does Not Require a "Spectrum Need" Study Where, as Here, Other Record Evidence Demonstrates Spectrum Congestion

First, Mtel asks the FCC to ignore the evidence of congestion that petitioners presented because, according to Mtel, petitioners' evidence is not the kind of evidence the agency should consider. Petitioners illustrated the existence of congestion in the BETR service by pointing out 22 situations (in five states) where telephone companies decided not to offer BETR service because of congestion and 10 situations (in the same five states) where telephone companies were prevented by frequency unavailability from adding additional transmitters to existing BETR systems in order to meet increased customer demand.[10/] According to Mtel, however,

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[10/] Several telephone companies who commented in support of the pending petition provided additional evidence of problems (continued...)

the FCC should not consider evidence of specific situations where a lack of spectrum has constrained the deployment of BETR systems, but instead should only consider evidence of spectrum shortages if the evidence is in the form of a "need study projecting out the demand for several years. . . ."[11/]

Mtel's request that the FCC consider evidence of spectrum congestion only if it is in the form of a "need study" is inconsistent with the agency's policy of considering credible evidence of spectrum shortages no matter what form the evidence takes. In 1989, for example, the agency found that the existing cellular radio service needed additional spectrum, and it based this decision in part on evidence of spectrum congestion in a few urban areas.[12/] In creating the 450 MHz air-ground service itself, moreover, the FCC chose to allocate 12 channels rather than

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[10/](...continued)
caused by spectrum shortages in the BETR Service. See "Comments of Century Telephone of Ark., Inc." at 1-2 (Feb. 8, 1993) (no additional channels are available to meet increased demand in north Arkansas); "Comments of the Ronan Telephone Co." at 1 (Feb. 8, 1993) (additional transmitters cannot be added to a four-channel BETR system serving portions of the Flathead Indian Reservation in Montana despite customer demand because all other channels already are used by other licensees); "Comments of the San Marcos Telephone Co., Inc." at 2 (Feb. 8, 1993) (a two-channel BETR system serving a rural area near San Marcos, Texas cannot be expanded despite a desire to do so because all other BETR channels are used by other licensees). Other commenters noted that frequency congestion is widespread in the BETRS service based on their personal experience. See "Comments of Southwestern Bell Telephone Co." at 2 (Feb. 8, 1993) and "Statement in Support" by Alcatel Network Systems at 7 (Feb. 8, 1993).

[11/] Mtel's "Comments in Opp. to Pet.", supra, at 5.

[12/] Report and Order in GEN. Dkt. No. 84-1231, 2 FCC Rcd. 1875, 1826-27 (1988).

a fewer number as some had proposed notwithstanding the absence of a "spectrum need" study. In fact, the Commission characterized the then-existing six channel experimental system as providing "satisfactory" service, but it noted that several parties had indicated that there had been a "recent increase in demand by users for additional airborne equipment and service", and it based its decision to allocate 12 channels to the service based in part on this evidence.[13/]

It also would be unwise as a matter of policy for the Commission to consider evidence of congestion only if it is in the form of a "need study". Specific examples of situations where spectrum shortages have caused problems constitute more credible evidence of congestion than a "need study" because a "need study", by its very nature, must make numerous speculative projections and assumptions which may not turn out to be accurate whereas concrete examples of problems caused by known spectrum shortages require no speculation.

B. Congestion Cannot Be Eliminated Through Digital Multiplexing Because Nearly 100 Percent of BETR Transmitters Already Operate in this Manner

Mtel also claims that the BETR service faces no spectrum shortage because BETR licensees could eliminate the need for more spectrum if BETR transmitters used already-allocated spectrum more efficiently by convincing manufacturers to make BETR transmitters

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[13/] Report and Order in Dkt. No. 16073, 22 FCC 2d 716, 722 (1969).

that use digital channel multiplexing techniques.[14/] In fact, almost 100 percent of all BETR transmitters now operating already employ state-of-the-art digital multiplexing techniques. Indeed, InterDigital's Ultraphone 100• system -- the market leader for providing BETR service -- allows four simultaneous telephone conversations on a single voice channel through the use of digital time division multiple access technology.[15/]

Mtel should not have been so quick to assert that the spectrum already allocated to the BETR service would be sufficient if BETR licensees utilized digital multiplexing techniques because, whereas BETR licensees face a spectrum shortage even though they already use digital multiplexing, 450 MHz air-ground licensees face no spectrum shortage and would have a vast surplus of channels if their air-ground transmitters -- all of which operate in an analog mode -- utilized digital multiplexing techniques.

III. Mtel is Wrong in Claiming that Cellular Licensees Can Provide BETR Service More Economically by Using the Cellular Frequencies They Already Are Licensed to Use

Apparently recognizing that the Commission will conclude that telephone companies are in fact experiencing severe congestion in the bands now allocated to the BETR Service, Mtel still asks the agency not to make additional spectrum available because it claims cellular licensees can provide this service more economically than

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[14/] Mtel's "Comments in Opp.", supra, at 5 n.7.

[15/] The BETR system made by Alcatel Network Systems likewise uses digital access technology. See Alcatel's "Statement in Support", supra, at 5.

telephone companies by using their existing cellular frequencies, as FCC rules already permit.[16/]

By claiming that cellular licensees can provide BETR service more economically than telephone companies, Mtel displays ignorance about the telephone and cellular industries because the fact is cellular companies cannot provide BETR service more economically than telephone companies for two reasons. First, a cellular licensee would be required to recover its BETR investment from a much smaller number of customers than a telephone company since the average telephone company serves more than 95 percent of the residents within its service area whereas the average cellular system serves less than 10 percent of the population.[17/] Second, unlike telephone companies cellular licensees would have to recover any BETR investment entirely from their cellular customers whereas under longstanding state and federal regulatory policies, a substantial part of a telephone company's BETR investment is recovered from interexchange carriers.[18/]

[16/] Mtel's "Comments in Opp.", supra, at 6.

[17/] In rural areas where BETR service is provided, the market share disparity is substantially greater because the vast majority of rural areas do not yet have any cellular service, and those that do have a market share substantially less than the 10 percent market share of the cellular industry as a whole.

[18/] See, e.g., Section 69.105 of the FCC's Rules (requiring interexchange carriers to pay local telephone companies a "carrier common line charge" to help pay for their local telephone plant and equipment) and Section 69.116 of the FCC's Rules (requiring interexchange carriers to contribute to a "universal service fund" the proceeds of which are used to help pay for the plant and equipment of local telephone companies serving high cost rural areas).

IV. Contrary to Speculation By NBAA and Mtel, Telephone Calls by Air-Ground Customers Would Rarely, If Ever, Be Blocked If BETR Licensees Operate Base Stations that are 640 Miles or More from the Nearest Co-Channel Air-Ground Base Station as Petitioners Propose

NBAA and Mtel also asked the Commission not even to initiate the rulemaking that petitioners request because they claim vaguely that telephone calls from aircraft flying above 41,000 feet could be blocked by a BETR base station operating on the same channel as an air-ground station even though the BETR station would be at least 640 miles from the co-channel air-ground station. Thus, NBAA states that a "business aircraft flying at a altitude of 41,000 to 50,000 feet. . . will have its ATG services impaired by BETRS stations operating within overlapping service volume on a co-primary basis".[19/] Mtel makes the same argument but expresses it even more vaguely than does NBAA.[20/]

The Commission should not countenance such conjecture for several reasons. First, the chance that a private aircraft subscribing to 450 MHz air-ground service would attempt to make a telephone call when flying more than 41,000 above ground is remote because a large number of 450 MHz air-ground customers fly turbo-prop aircraft, and these aircraft do not fly at altitudes above 41,000 feet, and even jet aircraft often fly below 41,000 feet.[21/]

19/ NBAA's "Statement in Opp.", supra, at 6.

20/ See Mtel's "Comments in Opp.", supra, at 7-8.

21/ It is not even theoretically possible for an aircraft passenger to make a telephone call through an air-ground base station that is more than 640 miles away if the aircraft passenger is flying at a more typical altitude of 20,000-35,000 feet because (continued...)

Second, even if an air-ground customer did attempt to make a telephone call when flying above 41,000 feet through a ground station that was more than 640 miles away, the call would be blocked by the co-channel BETR base station only in the rare situation where a BETR customer served by the co-channel BETR transmitter was simultaneously using the same channel. In addition, the call would be blocked only for a two or three minute period because after a few minutes time, the aircraft would have flown outside the range of theoretical blocking by the BETR station. Finally, present fingernail biting notwithstanding, the air-ground industry itself plainly knows that 450 MHz air-ground customers rarely -- if ever -- place calls through base stations that are more than 640 miles away since existing air-ground base stations are almost always located fewer than 600 miles from their closest neighbor.

V. In Order to Help Ensure the Economic Viability of the BETR Service, the FCC Also Should Consider Implementing Two Other Proposals In This Proceeding

Although Alcatel and InterDigital both endorsed the telephone industry's petition, they also both informed the FCC that the petition's proposals may be insufficient to preserve the economic viability of the BETR Service, and they recommended that the FCC go further in two respects. In view of the importance of these proposals, additional discussion of them is warranted.

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[21] (...continued)
transmissions in the 450 MHz range travel by line-of-sight, and the distant air-ground base station would not be within the line of sight of an aircraft flying at these lower altitudes.

A. The Agency Should Consider Allocating Vacant 450 MHz Air-Ground Channels to the BETR Service on an Exclusive Basis and Providing a Deadline for Air-Ground Licenses to Shut Down Existing Transmitters

First, Alcatel urged the FCC to allocate the vacant 450 MHz air-ground channels to the BETR Service on an exclusive basis and to provide a deadline for air-ground licensees to vacate the 450 MHz channels they presently occupy in order to cede the entire band to BETR licensees after the deadline.[22/] InterDigital urges the Commission to seek comment on the reallocation plan that Alcatel has suggested for two reasons. In the first place, an exclusive allocation of the air-ground frequencies to the BETR Service obviously would provide substantially more relief for the serious frequency congestion that now exists in this Service. Moreover, a reallocation of the type would provide an incentive for the 450 MHz air-ground industry to upgrade service by moving existing customers to the new 800 MHz air-ground service as the FCC itself has advocated. In establishing the 450 MHz service 23 years ago, the Commission held that it intended that the 450 MHz service would be a temporary service, and it urged all 450 MHz air-ground licensees to move their customers out of the 450 MHz service to a more sophisticated service as quickly as possible.[23/] Surely the Commission will agree that adding a couple of additional years to the 23 year transition it already has allowed is enough!

[22/] Alcatel's "Statement in Support", supra, at 8-11.

[23/] See Report and Order in Dkt. No. 16073, 22 FCC 2d 716, 718 (1969).

B. The Commission Should Not Apply to BETR Licenses Certain Regulations Governing Public "Mobile" Services Since These Regulations Threaten the Viability of the BETR Service

Second, while spectrum congestion plainly threatens the health of the BETR industry, both Alcatel and InterDigital also noted in their initial comments that the economic health of the service is jeopardized as well by virtue of the fact that FCC regulations governing public mobile services also apply to the BETR Service due to historical accident even though BETR transmitters are used primarily to facilitate the provision of regular fixed telephone service rather than to provide mobile service.[24/] Alcatel and InterDigital urged the Commission to use the present proceeding to correct this historical accident by explicitly exempting the BETR service from regulations governing the public mobile services. The agency could do this by placing BETR regulations under Part 21 of its Rules (governing "public fixed radio services") as petitioners have proposed. Alcatel and InterDigital pointed to several specific mobile service regulations that are of particular concern.[25/] For instance, whereas Sections 22.16 and 22.516 of the existing "public mobile service" rules have been interpreted by some to allow BETR licensees to obtain an additional frequency only

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[24/] Alcatel's "Statement in Support", supra, at 11-12; "Comments of InterDigital Commun. Corp." at 5-6. InterDigital also urged the FCC to impose a freeze on the filing of applications for paging licenses proposing to operate on any BETR frequency in the 450 MHz band, and it reiterates that request here. Id. at 4-5.

[25/] Several proposed rules about which Alcatel and InterDigital express concern were made by the Commission in its Notice of Prop. Rulemaking in CC Dkt. No. 92-115, supra.

if call blocking exceeds 25 percent, application of this rule to the BETR Service would threaten the economic viability of the Service since telephone companies, in providing regular fixed telephone service, need access to transmission capacity sufficient to ensure that call blocking does not exceed one percent.[26/] Similarly, whereas the FCC recently has proposed to prohibit applicants for public "mobile" services from applying for more than two new channels in a single application, applying this rule to the BETR Service would seriously frustrate growth in this Service as InterDigital pointed out in its initial comments.[27/]

CONCLUSION

It now should be clear: there is a severe shortage of spectrum available for the provision of BETR service. The Commission can

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[26/] Alcatel's "Statement in Support", supra, at 11.

[27/] "Comments of InterDigital Commun.", supra, at 5-6. InterDigital and Alcatel presented several other examples of similar problems in their initial comments as well.

reduce this congestion by revising its rules to allocate the 12 450 MHz air-ground channels to the BETR service. In addition to allocating additional spectrum to the BETR Service, the agency also should make clear that it will not apply to BETR licensees rules that are appropriately applied only to those who offer mobile services.

Respectfully submitted,

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